

1. Reagents and Test Solutions

Tannic Acid $C_{14}H_{10}O_9 \cdot nH_2O$ (Extra grade)

Tannic Acid - Acetic Acid TS Measure 10 mg of tannic acid, dissolve in 80 ml of acetic acid by shaking, and add 32 ml of phosphoric acid. Prepare freshly before use.

Tartaric Acid $HOOCCH(OH)CH(OH)COOH$ (Guaranteed)

Tetrabase - Citric Acid TS Weigh 0.25 g of 4,4'-tetramethyldiaminodiphenyl-methane and 1 g of citric acid, mix, and dissolve in 500 ml of water.

Tetrabutyl Ammonium Hydrogen Sulfate Tetrabutyl Ammonium Hydrogen Sulfate occurs as a white crystalline powder.

Content : Tetrabutyl Ammonium Hydrogen Sulfate contains not less than 98.0 % of tetrabutyl ammonium hydrogen sulfate ($[C_4H_9)_4N] HSO_4$).

Clarity of solution: A solution of Tetrabutyl Ammonium Hydrogen Sulfate (1 : 20) is almost clear.

Purity: Chloride Not more than 0.001% as Cl.

Add 5 ml of diluted nitric acid (1 : 3) and 1 ml of silver nitrate solution (1 : 50) to a solution containing 2 g of Tetrabutyl Ammonium Hydrogen Sulfate (2 : 20), and allow to stand for 15 minutes. White turbidity is formed. This turbidity is not deeper than that formed by adding 5 ml of diluted nitric acid (1 : 3) and 1 ml of silver nitrate solution (1 : 50) to 2 ml of chloride ion standard stock solution (1 : 10) and allowing to stand for 15 minutes.

Assay: Weigh accurately about 0.7 g of Tetrabutyl Ammonium Hydrogen Sulfate and dissolve in 100 ml of water freshly prepared before use as follows: Place water in a flask, boil for 15 minutes, cool with the flask connected to a soda lime pipe to block carbon dioxide in the air. Titrate with 0.1 mol/l sodium hydroxide solution (indicator: bromocresol green-methyl red TS).

1 ml of 0.1 mol/l sodium hydroxide solution = 0.033954g of $[C_4H_9)_4N] HSO_4$.

Tetracycline $C_{22}H_{24}N_2O_8$ Use tetracycline specified under the Japanese Pharmacopoeia.

4,4'-Tetramethyldiaminodiphenylmethane $C_{17}H_{22}N_2$ 4,4'-Tetramethyldiaminodiphenylmethane occurs as white to bluish white, lustrous, foliate crystals. It is slightly soluble in water, and soluble in ether, ethanol, and benzene.

Melting point: 90 - 91 °C.

Thymol $C_{10}H_{14}O$ Use thymol specified under the Japanese Pharmacopoeia.

Thymol Blue $C_{27}H_{30}O_5S$ (Guaranteed)

Thymol Blue TS Weigh 0.1 g of thymol blue, and dissolve in 100 ml of ethanol. Filter if necessary.

Thymol-Sulfuric Acid TS Weigh 0.5 g of thymol, dissolve in 5 ml of sulfuric acid, and add ethanol to make 100 ml.

Thymolphthalein $C_{28}H_{30}O_4$ (Guaranteed)

Thymolphthalein TS Weigh 0.1 g of thymolphthalein, and dissolve in 100 ml of ethanol. Filter if necessary.

Tin() Chloride $SnCl_2 \cdot 2H_2O$ (Guaranteed)

Titanium Trichloride Solution (Extra grade) Store in a light-resistant bottle with a ground-glass stopper.

d α -Tocopherol for Assay $C_{29}H_{50}O_2$ d α -Tocopherol for Assay occurs as a light yellow viscous liquid.

Content: d α -Tocopherol for Assay contains not less than 98.5 % of d α -Tocopherol ($C_{29}H_{50}O_2$).

Identification: Weigh accurately about 5 mg of d α -Tocopherol for Assay,

1. Reagents and Test Solutions

dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution. The solution exhibits absorption maximum near 292 nm.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 292 nm) = 67 - 82.

Weigh accurately about 5 mg of *d*- α -Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution.

Assay: Weigh accurately about 50 mg of *d*- α -Tocopherol for Assay, dissolve in *n*-hexane to make exactly 100ml. Use this solution as the test solution. Use 20 μ l of this solution, and perform Liquid Chromatography under the conditions below. Measure the area of each peak which appears within about twice the retention time of the main peak using the automatic integration method. Calculate the ratio of the area of the main peak to the total area of all peaks.

Operating conditions

Detector: Detector for absorbances in the ultraviolet region (determination wavelength: 292 nm).

Column: A stainless steel tube 3 - 6 mm in internal diameter and 5 - 10 cm in length.

Packing material of column: 510- μ m silica Gel for liquid chromatography.

Column temperature: Room temperature (constant).

Mobile phase: Mixture of *n*-hexane and isopropyl alcohol (200 : 1).

Flow rate: Adjust the flow rate so that the retention time of the main peak is about 5 minutes.

***d*-Tocopherol for Assay** $C_{28}H_{48}O_2$ *d*-Tocopherol for Assay occurs as a light yellow viscous liquid.

Content: *d*-Tocopherol for Assay contains not less than 98.5% of *d*-Tocopherol ($C_{28}H_{48}O_2$).

Identification: Weigh accurately about 5 mg of *d*-Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution. The solution exhibits absorption maximum near 296 nm.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 292 nm) = 77 - 95.

Weigh accurately about 5 mg of *d*-Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution.

Assay: Weigh accurately about 50 mg of *d*-Tocopherol for Assay, dissolve in *n*-hexane to make exactly 100ml. Use this solution as the test solution. Use 20 μ l of this solution, and perform Liquid Chromatography under the conditions below. Measure the area of each peak which appears within about twice the retention time of the main peak using the automatic integration method. Calculate the ratio of the area of the main peak to the total area of all peaks.

Operating conditions

Detector: Detector for absorbances in the ultraviolet region (determination wavelength: 292 nm).

1. Reagents and Test Solutions

Column: A stainless steel tube 3 - 6 mm in internal diameter and 15 - 25 cm in length.

Packing material of column: 5- to 10- μ m silica gel for liquid chromatography

Column temperature: Room temperature (constant).

Mobile phase: Mixture of *n*-hexane - isopropyl alcohol (200 : 1).

Flow rate: Adjust the flow rate so that the retention time of the main peak is about 10 minutes.

***d*-Tocopherol for Assay** $C_{28}H_{48}O_2$ *d*-Tocopherol for Assay occurs as a light yellow viscous liquid.

Content: *d*-Tocopherol for Assay contains not less than 98.5% of *d*-Tocopherol ($C_{28}H_{48}O_2$).

Identification: Weigh accurately about 5 mg of *d*-Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution. The solution exhibits absorption maximum near 297 nm.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 292 nm) = 83 - 103.

Weigh accurately about 5 mg of *d*-Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution.

Assay: Weigh accurately about 50 mg of *d*-Tocopherol for Assay, dissolve in *n*-hexane to make exactly 100ml. Use 20 μ l of this solution, and proceed the Liquid Chromatography under the conditions below. Measure the area of each peak which appears within about twice the retention time of the main peak using the automatic integration method. Calculate the ratio of the area of the main peak to the total area of all peaks.

Operating conditions

Detector: Detector for absorbances in the ultraviolet region (determination wavelength: 292 nm).

Column: A stainless steel tube 3 - 6 mm in internal diameter and 15 - 25 cm in length.

Packing material of column: 5- to 10- μ m silica gel for liquid chromatography.

Column temperature: Room temperature (constant).

Mobile phase: Mixture of *n*-hexane and isopropyl alcohol (200 : 1).

Flow rate: Adjust the flow rate so that the retention time of the main peak is about 11 minutes.

***d*-Tocopherol for Assay** $C_{27}H_{46}O_2$ *d*-Tocopherol for Assay occurs as light yellow viscous liquid.

Content: *d*-Tocopherol for Assay contains not less than 98.5% of *d*-Tocopherol ($C_{27}H_{46}O_2$).

Identification: Weigh accurately about 5 mg of *d*-Tocopherol for Assay, dissolve in absolute ethanol to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution. The solution exhibits absorption maximum near 298 nm.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 298 nm) = 83 -

1. Reagents and Test Solutions

101.

Weigh accurately about 5 mg of *d*-Tocopherol for Assay, add absolute ethanol and dissolve to make exactly 10 ml. Measure exactly 1 ml of this solution, and add absolute ethanol to make exactly 10 ml. Measure the absorbance of this solution.

Assay: Weigh accurately about 50 mg of *d*-Tocopherol for Assay, dissolve in *n*-hexane to make exactly 100ml. Use this solution as the test solution. Use 20 μ l of this solution, and perform Liquid Chromatography under the conditions below. Measure the area of each peak which appears within about twice the retention time of the main peak using the automatic integration method. Calculate the ratio of the area of the main peak to the total area of all peaks.

Operating conditions

Detector: Detector for absorbances in the ultraviolet region (determination wavelength: 292 nm).

Column: A stainless steel tube 3 - 6 mm in internal diameter and 15 - 25 cm in length.

Packing material for column: 5- to 10- μ m silica gel for liquid chromatography.

Column temperature: Room temperature (constant).

Mobile phase: Mixture of *n*-hexane and isopropyl alcohol (200 : 1).

Flow rate: Adjust the flow rate so that the retention time of the main peak is about 20 minutes.

Toluene $C_6H_5CH_3$ (Guaranteed)

***o*-Toluenesulfonamide** $C_7H_9NO_2S$ *o*-Toluenesulfonamide occurs as colorless crystals or a white crystalline powder.

Melting point: 157 - 160 .

Purity: *p*-Toluenesulfonamide With a solution of *o*-Toluenesulfonamide in ethyl acetate (1 : 5,000), perform Gas Chromatography under the operating conditions specified in the Purity (6) for Sodium Saccharin in the Monographs. Only one peak of *o*-toluenesulfonamide is observed.

. 移動

Trichloroacetic Acid CCl_3COOH (Guaranteed)

Trichloroacetic Acid TS Dissolve 18 g of sodium acetate, anhydrous, 110 ml of 1 mol/l trichloroacetic acid solution and 19 ml of acetic acid in about 600 ml of water. Adjust the pH to 4.0 using 1 mol/l sodium hydroxide, and add water to make 1,000 ml.

Triethanolamine See 2,2',2''-Nitrilo-triethanol.

Trifluoroacetic Acid CF_3COOH Trifluoroacetic Acid occurs as a colorless transparent liquid having pungent odor. It is very soluble in water.

Content: Trifluoroacetic Acid contains not less than 99.0 % of trifluoroacetic acid (CF_3COOH)

Identification: (1) Trifluoroacetic Acid is acidic.

(2) Proceed as directed under the Liquid Film Method in Infrared Spectrophotometry. Absorption bands are observed at about 3,180 cm^{-1} , 1,785 cm^{-1} , 1,458 cm^{-1} , 1,170 cm^{-1} , 811 cm^{-1} and 687 cm^{-1} of wavelengths.

Purity: Unvolatile matter Not more than 0.02 %.

Weigh 10.0 g of Trifluoroacetic Acid, evaporate, and dry at 100 for 2 hours. Cool in a desiccator for about 30 minutes and weigh the weight of the residue.

Assay: Weigh accurately about 3 g of Trifluoroacetic Acid, and add 30 ml of

1. Reagents and Test Solutions

water. Titrate with 1 mol/l sodium hydroxide (indicator: phenolphthalein).

1 ml of 1 mol/l sodium hydroxide = 114.02 mg of CF₃COOH

2,4,6-Trinitrophenol (NO₂)₃C₆H₂OH (Guaranteed)

Triphenylchloromethane (C₆H₅)₃CCl (Guaranteed)

Triphenylphosphine Oxide C₁₈H₁₅OP Triphenylphosphine Oxide occurs as a very slightly brownish white powder.

Content: Triphenylphosphine Oxide, when dried, contains not less than 98% triphenylphosphine oxide (C₁₈H₁₅OP).

Melting point: 156 - 158 .

Clarity of solution: A solution of Triphenylphosphine Oxide in acetone is clear light brown.

Assay: Weigh accurately about 10 mg of Triphenylphosphine Oxide, previously dried for 24 hours in a desiccator under a reduced pressure, and dissolve in methanol to make exactly 100 ml. Measure exactly 1.0 ml of this solution, add a mixture of acetonitrile and water (67 : 33) to make exactly 100 ml, and use the resultant solution as the test solution. Measure 20 µl of the test solution, and perform Liquid Chromatography under the operating conditions specified in Purity (8) for Sucralose in the Monographs. Calculate the main peak area by automatic integration method, and determine the Triphenylphosphine Oxide (TPPO) content using the formula

$$\text{TPPO (\%)} = \frac{\text{peak area of TPPO for the test solution}}{\text{Total peak area}} \times 100.$$

Tris(hydroxymethyl)Aminomethane H₂NC(CH₂OH)₃ Tris(hydroxymethyl)Aminomethane occurs as a white to light yellow crystalline powder.

Content: Tris (hydroxymethyl) Aminomethane contains 99.0% - 101.0% of tris (hydroxymethyl) aminomethane [H₂NC(CH₂OH)₃].

Melting point: 169 - 173 .

Assay: Weigh accurately about 2 g of Tris(hydroxymethyl)Aminomethane, dissolve in 50 ml of water, and titrate with 1 mol/l hydrochloric acid. Confirmation of the titration end point is usually made by a potentiometer.

1 ml of 1 mol/l hydrochloric acid = 121.14 mg H₂NC(CH₂OH)₃.

Trisodium Citrate Dihydrate Na₃C₆H₅O₇ · 2H₂O (Trisodium citrate Dihydrate, Guaranteed)

Trisodium Salt of 7-Hydroxy-1,3,6-naphthalene-trisulfonic Acid

C₁₀H₅Na₃O₁₀S₃ Trisodium Salt of 7-Hydroxy-1,3,6-naphthalene-trisulfonic Acid occurs as a white to whitish powder.

Specific absorbance:

$E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 288 nm) = Not less than 105.

Dry Trisodium Salt of 7-Hydroxy-1,3,6-naphthalene-trisulfonic Acid for 24 hours in a vacuum desiccator, weigh 10.0 mg of it, dissolve in ammonium acetate solution (3 : 2,000) to make exactly 100 ml. Use this solution as solution A. Measure exactly 10 ml of solution A, add ammonium acetate solution (3 : 2,000) to make exactly 100 ml. Measure the absorbance of this solution. The solution exhibits an absorption maximum at the wavelengths of 240 nm, 288 nm and 344 nm.

Purity: Other aromatic substances Measure exactly 10 ml of solution A, add ammonium acetate solution (3 : 2,000) to make exactly 100 ml. Measure 20 µl of this solution, perform Liquid Chromatography using the operating

1. Reagents and Test Solutions

conditions directed under Purity (6) for Food Red No.2 in the Monographs, JSFA- . Only one peak is observed.